



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,997	10/19/2004	Shih-Feng Shao	TMIP0005USA	5996
27765	7590	01/25/2006	EXAMINER	
NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION			AU, BAC H	
P.O. BOX 506			ART UNIT	
MERRIFIELD, VA 22116			PAPER NUMBER	
			2822	

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/711,997

Applicant(s)

SHAO ET AL.

Examiner

Bac H. Au

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 8-11, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (AAPA) in view of Doan (U.S. Pub. 2005/0167799).

Regarding claims 1 and 11, AAPA [Fig.2] discloses a method of dicing a wafer, comprising:

providing a carrier [34], the carrier consecutively having a bonding layer [32] and an extendable film positioned thereon;

providing a wafer [30], and bonding the wafer to the extendable film through a bottom surface of the wafer;

performing a dicing process to dice the wafer into a plurality of dies [38; para.7 lines 1-2];

providing a wafer [30], the wafer being supported by a carrier [34]; and a bonding layer [32] and an extendable film being positioned between the carrier and the wafer;

Art Unit: 2822

forming a photoresist pattern [36] on a surface of the wafer to define scribe lines of the wafer [Para.7 lines 2-4];

performing an anisotropic etching process to remove the wafer uncovered by the photoresist pattern to form a plurality of dies [Para.7 lines 4-7]; and

separating the bonding layer from the carrier [Para.8 lines 7-9].

AAPA fails to disclose the carrier having an extendable film positioned thereon; bonding the wafer to the extendable film through a bottom surface of the wafer; separating the extendable film from the carrier; and

wherein an extendable film being positioned between the carrier and the wafer.

However, Doan [Figs.7-8A] discloses the carrier [132] having an extendable film [134] positioned thereon; bonding the wafer [100] to the extendable film through a bottom surface of the wafer [Para.40 lines 1-6]; separating the extendable film from the carrier [Fig.8A]; and an extendable film being positioned between the carrier and the wafer.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Doan into the method of AAPA to incorporate an extendable film positioned thereon a carrier; bonding the wafer to the extendable film through a bottom surface of the wafer; separating the extendable film from the carrier; and an extendable film being positioned between the carrier and the wafer.

The ordinary artisan would have been motivated to modify AAPA in the manner set forth above for at least the purpose of displacing the individual semiconductor devices from each other and further expose their side edges for subsequent coating [Doan; para.42 lines 1-6].

Regarding claims 8-10 and 18-19,

AAPA and Doan disclose

wherein the dicing process comprises:

forming a photoresist pattern [36] on a top surface of the wafer [30] to define scribe lines of the wafer [AAPA; fig.2; para.7 lines 2-4];

performing an anisotropic etching process to remove the wafer uncovered by the photoresist pattern [AAPA; fig.2; para.7 lines 4-7];

further comprising removing the photoresist pattern after the dicing process; anisotropic etching process is finished [AAPA; para.8 lines 7-9]; and

further comprising performing a wafer expansion [Doan; fig.8A] and wafer sorting process after the extendable film is separated from the carrier [Doan; para.47 lines 1-5].

2. Claims 2-7, 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Doan as applied to claims 1, 8-11, and 18-19 above, and further in view of Liu (U.S. Pub. 2002/0123210).

Regarding claims 2-3, 5-6, 12-13, and 15-16, AAPA and Doan fail to disclose the method wherein the bonding layer is a heat sensitive tape;

Art Unit: 2822

wherein separating the extendable film from the carrier is implemented by heating;

wherein the bonding layer is a UV tape; and

wherein separating the extendable film from the carrier is implemented by UV curing.

However, Liu [Figs.6-8] discloses the method

wherein the bonding layer [9] is a heat sensitive tape [Para.71 lines 1-6];

wherein separating the extendable film [10] from the carrier is implemented by heating [Para.74 lines 1-3];

wherein the bonding layer is a UV tape [Para.5 lines 3-5]; and

wherein separating the extendable film from the carrier is implemented by UV curing [Para.5 lines 5-8].

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Liu into the method of AAPA and Doan to include wherein the bonding layer is a heat sensitive tape; wherein separating the extendable film from the carrier is implemented by heating; wherein the bonding layer is a UV tape; and wherein separating the extendable film from the carrier is implemented by UV curing.

The ordinary artisan would have been motivated to modify AAPA and Doan in the manner set forth above for at least the purpose of making the separation of the wafer from the carrier easier and without damaging the wafer [Para.5 lines 5-11].

Art Unit: 2822

Regarding claims 4, 7, 14 and 17, AAPA, Doan, and Liu disclose

wherein the extendable film is an extendable tape [Doan; 134 of Fig.8A; para.40 lines 6-9], and the melting point of the extendable tape is higher than the melting point of the heat sensitive tape [It is obvious that the melting point of the extendable tape is higher than that of the heat sensitive tape (bonding layer). If this were not the case, the diced chips would not be held in place to be extended as desired, when the bonding layer is heat treated to release the wafer from the carrier].

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bac H. Au whose telephone number is 571-272-8795.

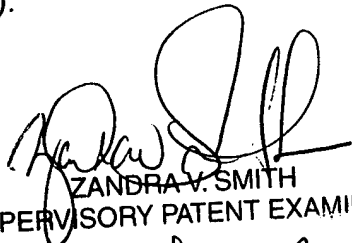
The examiner can normally be reached on Mon-Fri 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2822

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BHA


ZANDRA V. SMITH
SUPERVISORY PATENT EXAMINER
20 Jan. 2016